

CALIFORNIA AERATION PLAN (CAP) FOR STRUCTURAL FUMIGATIONS

SCOPE

The structural pest control industry has developed the California Aeration Plan (CAP), as a Fumigation Safety Program (Program), for employers and employees to follow to meet the requirements of Title 3 California Code of Regulations Section 6780. Employers may use this Program in lieu of requiring air-supplied respirator equipment or continuous monitoring when aerating tarp-contained structural fumigations with sulfuryl fluoride or methyl bromide.

PLAN OVERVIEW

Fumigant aeration is conducted remotely by pre-positioned inlet devices, ducting and aeration fans. This Program supersedes Aeration Procedure 1 and Aeration Procedure 2 on sulfuryl fluoride product labeling (check for all SF labels). Follow all other sulfuryl fluoride product labeling. If equipment failure or other mishap requires entry to a fumigated structure or space before the completion of aeration, employees must use self-contained breathing apparatus (SCBA) or continuous monitoring of fumigant levels. This aeration plan is designed to complement existing fumigation requirements.

It is highly recommended to use the lowest recommended rate of chloropicrin as prescribed by the label or fumigant calculator. Chloropicrin should not be applied directly in rooms with a heavy storage load. Fans should be placed in rooms with a heavy storage load to facilitate the aeration of chloropicrin.

PREPARATION FOR FUMIGATION: INTERNAL OPENINGS

Open all operable and accessible internal doors and openings, including:

- a. Attics and subareas;
- b. Storage chests, cabinets, drawers, closets; and,
- c. Appliances (such as washers, dryers, dishwashers, microwaves and ovens).

If the structure has an attached garage, open the door between the garage and the structure. Direct a fan into attic openings.

PREPARATION FOR FUMIGATION: EXTERNAL OPENINGS

Open at least one operable window at least 3 inches for each room, including the garage, that contains a window that can be accessed and opened by normal means (without moving furniture, removing nails, or cutting a paint seal). If a room does not have an operable window, use a fan to aid aeration of that room.

For multi-story structures, windows on the ground level may be left closed provided the ground level has a common interior airspace with an upper floor and fans are placed to create air movement from the ground level to the upper floor.

If a majority of windows are sealed or inoperable, use an alternative fresh air source (doorway, air handling system, etc.). If doorways are used to allow for air exchanges, the doors must be secured against unauthorized entry. This may require fastening vented security barricades over doorways.

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PREPARATION FOR FUMIGATION: AERATION DEVICES

Aeration equipment is comprised of aeration fans (connected to aeration ducting), aeration ducting, and inlet devices. This aeration equipment is installed prior to fumigation so aeration can be initiated from outside the fumigated space and without removing seals.

FANS

Each aeration fan must be at least 18 inches in diameter. The minimum number of aeration fans required depends upon the volume of the fumigated structure and is specified in Table 1. Aeration fans are turned on only to ventilate fumigant from the structure.

Place aeration fans within the fumigated space to draw fresh air through the structure. Use extension cords, remote relays, or other devices during aeration fan installation to enable activation of aeration fans from outside of the fumigated space at the initiation of aeration.

AERATION DUCTING

Connect each aeration fan securely to durable reinforced ducting, minimum 18-inch diameter, that does not easily collapse or restrict air flow when extended. The ducting must be of sufficient length to extend from the attached fan inside the fumigated space, through tarpaulins, to the first story roofline or at least 10' above ground level for higher rooflines, and discharge vertically outside of the fumigated space. Do not exhaust fumigant directly toward sensitive areas such as occupied structures.

Seal the aeration duct in a manner that it can be opened remotely from ground level when aeration is initiated. If the aeration duct seal cannot be removed remotely use self-contained breathing apparatus (SCBA). Seal tarps around the aeration ducting.

INLET DEVICES

Inlet devices must: (1) maintain the integrity of the required opening; (2) have the opening covered with material allowing ventilation, such as wire, plastic netting or mesh; and, (3) have an opening of at least 254 square inches each (equivalent to the surface area of an 18 inch duct).¹ Place inlet devices on the side of the structure opposite from the side where the discharge of aeration ducting is located. The minimum number of aeration inlets required depends upon the volume of the fumigated structure and is specified in Table 1.

Locate inlet devices where the opening is not blocked, and the entire inlet opening is at least 4 feet above exterior grade. Cover the opening of the inlet devices with highly resistant material, such as polyethylene sheeting of at least 4 mil thickness, vinyl coated nylon, or nylon polymer film. Seal inlet devices in a way that allows external opening during aeration.

¹ If inlet devices smaller than 254 square inches are used, the total opening of all inlets must be at least (Minimum Number of Inlet Devices) x (254 square inches).

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AERATION AND REENTRY

The minimum time required to aerate the structure is determined by the initial concentration of fumigant introduced and is specified in Table 2. No workers are allowed on the roof without use of self-contained breathing apparatus (SCBA) when aeration fans are operating.

When the high ambient temperature for the aeration period is below 40°F at the fumigation site, a minimum of 24 hours of aeration is required.

All of the following steps must be completed in sequence. A licensed Operator or Field Representative must be present for, and assure completion of, Steps 1 and 4.

Step 1:

To initiate aeration, activate the aeration fan(s) and remove the seal from each previously installed aeration duct. Do not begin aeration between midnight and 30 minutes before dawn, unless specifically permitted by local regulatory authority. After all aeration fans are activated, remove the seal from each previously installed inlet device.

Step 2:

Anytime after the required hours of aeration are completed, as specified in Table 2, turn off the aeration fan(s).

Step 3:

Remove all tarpaulins and/or seals from the structure.

Do not enter the structure without SCBA or continuous monitoring until the completion of Step 4.

Step 4:

If the structure has a central air system, turn on only the fan (or blower) for each operational unit. As an alternative, a circulation fan may be placed in front of a furnace inlet to blow air into central heating and cooling ducts. Remove all chloropicrin evaporation containers from the fumigated space.

Measure the concentration of fumigant in breathing zones (where people typically stand, sit or lie down) using an approved detection device as per fumigant label. If the concentration of fumigant is greater than 1 ppm, ventilate structure with operable doors and windows open and confirm concentrations are 1 ppm or less before the structure is reoccupied.

Structure may be reoccupied when the concentration of fumigant is 1 ppm or less.

Respiratory Protection Requirement

Use of a supplied-air respirator is not normally required for any part of this aeration procedure. Persons entering a fumigated structure in response to equipment malfunction or emergency at any time before certification for re-occupancy is completed, must use SCBA as required by California Code of Regulations, Title 3 section 6739 and Title 16 section 1971.

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TABLE 1

Determining the Minimum Number of Ducted Aeration Fans and Inlet Devices

Fumigated Structure Size (cubic feet)	Minimum Number of Ducted Aeration Fans	Minimum Number of Inlet Devices²
60,000 or less	1	2
60,001 to 120,000	2	3
120,001 to 180,000	3	4
180,001 to 240,000	4	5
for each additional 60,000 over 240,001	1 additional vent fan unit AND	1 additional inlet device

TABLE 2

Determining Minimum Aeration Time

Initial Concentration of Fumigant Introduced (ounces per thousand cubic feet)	Minimum Aeration Time (hours)
16 or less	12
17 to 32	14
33 to 48	16
49 to 64	18
65 to 96	20
97 to 112	22
> 112	24

² Each inlet device must have an opening of at least 254 square inches. If inlet devices smaller than 254 square inches are used, the total opening of all inlets must be at least (Minimum Number of Inlet Devices) x (254 square inches)